SECTION 1
INTRODUCTION

Cape Environmental Management Inc. (CAPE), under subcontract to Barry A. Vittor and Associates (BVA), has been contracted by the U.S. Army Corps of Engineers – New York District (USACE – NY) to perform a Brownfields Site Assessment for the dogleg of Glen Cove Creek and Mill Pond, Glen Cove, New York. This project was performed under Contract Number DACW51-97-D-0009.

This report represents the Brownfields Site Assessment for the dogleg of Glen Cove Creek and Mill Pond. The report describes the sampling activities that were performed in February 2000, presents the laboratory data results and data evaluation, and provides conclusions for the site assessment.

1.1 PROJECT BACKGROUND

A Federal multi-agency partnership selected the City of Glen Cove, New York as a National Brownfields Showcase Community. The U.S. Army Corps of Engineers, New York District (USACE-NYD) entered into an Interagency Agreement with the U.S. Environmental Protection Agency (USEPA) to provide technical services in support of the Glen Cove Brownfields Showcase. The City of Glen Cove and the Glen Cove Community Development Agency have jointly established the *Glen Cove Creek Revitalization Plan* (GCCRP, 1996), envisioning a blend of industrial, recreational, and natural areas which would create approximately 1,700 jobs within the Glen Cove Creek Waterfront Area.

Historically, the Waterfront Area has been a hub for commercial and industrial activity on Long Island. Currently, industrial facilities, abandoned buildings and vacant land occupy the Glen Cove Creek Waterfront District. Brownfields occupy approximately 146 acres within this Area and may be potential sources of contamination and sedimentation to the adjacent Glen Cove Creek.

Potential future actions will be coordinated with the GCCRP with the intended result of improved water quality, reduced sediment loading and dredging requirements, and enhanced aesthetics and restored aquatic and terrestrial habitats.

This project focuses on the first phase of the redevelopment process which involves the assessment of the dogleg of Glen Cove Creek and the Mill Pond area.

1.2 SITE LOCATION AND DESCRIPTION

The dogleg of Glen Cove Creek (herein referred to as "the dogleg") and Mill Pond are located in the City of Glen Cove, Nassau County, Long Island, New York. The United States Geological Survey (USGS) 7.5 minute Topographical Map – Sea Cliff Quadrangle for the area is included in Figure 1 of Appendix A. The site is located at approximately 40° 51' 36" north and 73° 38' 25" west. A site map illustrating the dogleg and Mill Pond as well as the surrounding area is provided in Figure 2 of Appendix A. A description of each portion of the site is provided in the following subsections.

1.2.1 Dogleg of Glen Cove Creek

The dogleg is located at the northeasternmost end of Glen Cove Creek and occupies approximately 1 acre. It is bordered by Charles Street to the north and east and industrial sites to the south and west, as shown in Figure 2 of Appendix A. Glen Cove Creek is a tidal waterway that is approximately 400 feet in length and discharges into Hempstead Harbor and the Long Island Sound.

Specific features of the dogleg are described below:

- Water levels within Glen Cove Creek vary approximately 8 feet between low tide and high tide. This results in the draining and exposure of the sediments in the dogleg north of the waterway portion of Glen Cove Creek during low tide.
- An outfall located in the southern portion of the dogleg discharges water from a storm sewer. According to City of Glen Cove personnel, the outfall services a large spring that originates at the former Duryea Starch Works south of the dogleg.
- The effluent from Mill Pond flows over a concrete weir and discharges into the dogleg via a rectangular concrete culvert in the southeastern bulkhead of the dogleg.
- An old outfall is located in the northeastern end of the dogleg. The outfall is the old spillway for Mill Pond. Although the spillway has been decommissioned, it was observed that some water from Mill Pond has developed a flow pathway underneath the decommissioned spillway.
- A fourth outfall is located on the slope at the northern end of the dogleg. The outfall originates from a 2-foot diameter concrete pipe approximately 10 ft above the dogleg surface. According to Glen Cove personnel, this outfall is a storm sewer originating from the Konica facility north of the dogleg. This outfall was used as an industrial discharge point for the Konica facility during its operation, and was most recently used as a discharge point for emergency overflow from a groundwater extraction and treatment system. The treatment system is no longer in operation. However, flow still exists through the outfall pipe.

- Miscellaneous debris, including discarded masonry, old bicycles, and trash exist in various locations throughout the dogleg and its side slopes.

1.2.2 Mill Pond

Mill Pond, adjacent to Pratt Park, is located immediately northeast of Glen Cove Creek and is approximately 4 acres in size. The pond is bordered by Herb Hill Road to the north, Glen Cove Avenue on the east, the Glen Cove Fire Department to the south, and Charles Street to the west, as shown in Figure 2 of Appendix A. The area of the pond also contains a small park in the northwest footprint, adjacent to Charles Street. Surrounding land uses include a residential area to the north, the downtown district of the City of Glen Cove to the east and south, and the industrial areas surrounding Glen Cove Creek to the west. A stormwater treatment system is currently under construction in the northeast corner of the park.

Specific features of Mill Pond are provided below:

- Mill Pond currently consists of several defined flow channels in a forested wetland. According to historical records, the area used to be a complete pond. However, the pond has been reduced to flow channels due to sedimentation.
- Mill Pond receives water from two rectangular culverts. The primary culvert is located in the northeastern end of the pond. According to Glen Cove personnel, the water originates from the culverted Cedar Swamp Creek, which flows beneath the business district of the city. The second culvert is located on the eastern end of the pond, and receives stormwater from the city.
- Several small outfalls are located in the northern and southern portions of the pond. These outfalls generally consist of 4-inch diameter terra cotta pipes. The origins of these outfalls are not known.
- The water located within Mill Pond flows through the pond in defined channels and discharges over the concrete weir in the southwestern end of the pond. This water then flows into the dogleg of Glen Cove Creek.
- Miscellaneous debris, predominately in the form of household trash, exists in several areas of the pond.

1.3 ENVIRONMENTAL SETTING

1.3.1 Topography

According to the USGS 7.5 minute Topographic Map - Sea Cliff Quadrangle (Figure 1 of Appendix A), the topography of the site ranges from 0 ft above mean sea level (msl) within Glen Cove Creek to approximately 70 ft msl in the southern portion of the City of Glen Cove. According to the *Planning Aid Report for the City of Glen Cove (USACE,1997)*, the elevation of Mill Pond ranges from 12.5 ft msl at the water surface to 15 ft msl within the forested wetland. The slopes of Mill Pond on its northern and eastern sides rise to approximately 20 ft msl, with some slopes displaying a grade of greater than 10 percent.

1.3.2 Geology

The Alignment is situated within Hydrogeologic Zone VIII: North Shore Shallow Flow System. The land constituting Zone VIII occupies a band of varying width along the North Shore of Long Island in both Nassau and Suffolk Counties. Groundwater flows toward the harbors, bays or to the Long Island Sound. Zone VIII has been restricted to those locales for which extant hydrologic data shows a horizontal or upward movement of groundwater. A significant portion of the precipitation in Zone VIII runs off to bays and to bay tributaries. A major part of the shoreline is also characterized by a high water table. The flow from the North Shore Flow System of Hydrogeologic Zone VIII discharges primarily to streams and marine surface waters and, hence, has a greater effect on these systems than on the deep flow drinking water supply.

The stratigraphy under The Alignment consists of the following geologic formations in ascending order:

- Cambrian/Paleozoic metamorphic and igneous bedrock
- Cretaceous Raritan Formation, Cretaceous Lloyd Sand Member (an aquifer)
- Cretaceous Raritan Formation Clay Member (a confirming member)
- Upper Cretaceous Magothy Formation (an aquifer)
- Pleistocene age Jameco Gravel (an aquifer)
- Pleistocene Gardiners Clay (a confining unit)
- Pleistocene Upper Glacial deposits (an aquifer)

The Lloyd Sand Member overlies the bedrock and consists mainly of fine to coarse sands interbedded with sand and small to large pebble gravel. The Lloyd Aquifer is highly confined where the Raritan Clay is present.

The clay member of the Raritan Formation consist mainly of clay and silty clay beds with some interbedded sands and is the upper confining unit of the Lloyd aquifer and overlies the Magothy.

The Magothy Formation (and Matawan Group) are mostly very fine to medium sands with interbedded clay and course sand. The Magothy aquifer is the thickest hydrogeologic unit on Long Island and the most widely tapped for public water. It ranges from poorly to highly confined. It is highly confined where the Gardiners Clay is present in southern Queens. However, in northern Queens, the Magothy is a very leaky, confined aquifer.

The Jameco Gravel ranges from coarse to sand and gravel with cobbles and boulders to finer combinations with few layers of clay and silt. The Jameco and Magothy Aquifers often act as one.

The Gardiners Clay consists mainly of clay and silt with interbedded sand and gravel. This formation confines the Jameco and Magothy Aquifers.

The upper Pleistocene glacial deposits consist of highly permeable sands and gravel of outwash deposits and less permeable unsorted terminal and ground moraine sediments that contain greater proportions of clay and silt. In central Queens, the Harbor Hill Terminal Moraine marks the farthest advance of the Wisconsin glacier and extends eastward toward the north fork. Groundwater here is locally confined due to the moraine deposits with clay and silt beds.

Depth to groundwater in the upper Pleistocene ranges from about 10-12 feet below grade (ft-bg) at the intersection of Glen Cove Road and Glen Cove Avenue to 5 ft-bg (or less) along Herb Hill road, adjacent to Glen Cove Creek.

1.4 SITE HISTORY

The following historical description of the Glen Cove Creek area is derived from the *Glen Cove Creek Revitalization Plan* (GCCRP, 1996).

The waterfront has played a pivotal role in the history of Glen Cove. When Joseph Carpenter built the first dam on Glen Cove Creek for a sawmill and gristmill in 1668, the natural harbor had long been used by the Matinecocks for fishing and shellfishing. Lumber was carried to New York City on coastal sloops to be used for building homes and military fortifications. Flour from the gristmills would be used as far away as Nova Scotia to provision fishing ships.

In 1829, regularly scheduled steamboat service commenced with the construction of a wharf, one-quarter mile north of Musketa cove at what is commonly referred to as "The Landing" area of Glen Cove. Boats such as the *Linnaeus*, the *Sewanhaka*, the *Idlewild*, the *Glen Cove* and the *Long Island* carried passengers to New York City. Within a year of the start of steamboat service, a hotel was constructed at "The Landing" which catered to tourists seeking to escape Manhattan's sweltering summer heat. By the Civil War, dozens of hotels, boarding houses, and oyster bars had sprung up to serve the burgeoning local tourism industry. By the late 1850's, wealthy New York City residents started building permanent summer homes in Glen Cove. This was the beginning of the "Gold Coast" era with the construction of the palatial mansions of J.P. Morgan, F. W. Woolworth, Charles Pratt of Standard Oil, Henry Clay Folger (founder of the Folger Shakespeare Library), and Marcus Loew of MGM and Loew's Theaters.

Although "The Landing" eclipsed Glen Cove Creek as Glen Cove's principal port from 1850 through 1890, it never fully supplanted it. Instead, the Creek became the center of industry in Glen Cove with raw materials and products brought to factories by barge. Sheetmetal was delivered to Glen Cove by barge and fabricated into an assortment of decorative and utilitarian items. Brickyards exploited local clay deposits. The Duryea

Starch Manufacturing Company, established on the south side of Glen Cove Creek in 1857, had an enormous influence on the evolution of Glen Cove. The combination of pure spring water, voluminous regional corn production and ready access to water borne transportation enabled the starch industry to produce and ship its product to markets worldwide.

With the regional corn production waning in the late 19th century, the Duryea Starch Works closed. However, a variety of industries supplanted it, continuing the use of the Creek as an industrial area. These included Ladew Leather Belting Company, Columbia Carbon and Ribbon (also know as Powers Chemco and Konica) and Wah Chang Smelting and Refining Company (Li Tungsten).

In 1929, the City of Glen Cove acquired and deeded the Glen Cove Creek to the U.S. Army Corps of Engineers (USACE). This enable the federal government to straighten, dredge and maintain the Creek as a federal navigation channel. The reconfigured creek and its adjacent defense plants played a vital role in the war effort during the Second World War. The dogleg of Glen Cove Creek was not included in the deed to the USACE.

Although some of these industries remain, many closed due to changes in technologies, changing economies, and the reduction of government contracts for defense industries. During the past decade, there has been a major shift from heavy industry to light manufacturing, factory outlet retailing and commercial offices. Many of these new companies have adapted existing industrial buildings to new uses and have a low environmental impact.

1.5 INVESTIGATIVE ACTIVITIES IN THE VICINITY OF THE SITE

As referenced previously, the properties immediately adjacent to Glen Cove Creek are primarily used for industrial purposes. Five inactive hazardous waste sites, totaling approximately 50 acres, have property either bordering or in the vicinity of the creek.

No industrial activities appear to directly impact Mill Pond. The pond is surrounded by residential and commercial properties; however, the pond does receive waters from Cedar Swamp Creek and a stormwater outfall. These waterways may have been impacted by industrial activities, although no direct impact to these waterways has been identified.

The following subsections provide a summary of investigative activities that have been conducted that may relate to potential impact of contamination within the dogleg and Mill Pond.

1.5.1 Sediment Sampling Activities

Nassau County Department of Health Sediment Analysis of Pratt (Mill) Pond, December 1985

Pursuant to a request from the City of Glen Cove, the Health Department collected sediment samples from three locations within Pratt (Mill) Pond. The samples were analyzed for EP toxicity, coliforms, and grain-size distribution.

Based on the sampling results, the Health Department concluded that any dredge material removed from the pond can be disposed of at any location except "where rain falling on the dredged material will be discharged into a surface water". This restriction was due to the high coliform count and large amounts of clay, silt, and organic debris in some samples.

New York Department of Transportation (NYDOT) Sediment Sampling, September 1988

The NYDOT collected soil samples from four locations within the dogleg. The samples were collected in an area adjacent to the old spillway directly west of Charles Street. The samples were collected to support a proposed alternative design involving the "filling" of part of the dogleg to support a roadway improvement project for Charles Street.

The samples were analyzed for EP toxicity (the predecessor to the Toxicity Characteristic Leaching Procedure (TCLP)), PCBs, Chlordane, and four metals.

USACE Technical Report for Testing of Material Proposed for Dredging and Ocean Disposal from Glen Cove Creek, December 1995

CDM Federal Programs Corporation and AquaSurvey, Inc., under contract to the USACE-NYD, performed sediment sampling activities in support of proposed dredging activities within Glen Cove Creek (excluding the dogleg). The sediment samples were analyzed for radiological and toxicological properties.

Dredge Material Analysis of Glen Cove Creek – Preliminary Data, March 1996

The Office of the Harbormaster for the City of Glen Cove conducted sediment sampling activities at various locations within Glen Cove Creek. No sample location map was included in the report. A total of as 29 samples were collected and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), Pesticides/PCBs, Target Analyte List (TAL) metals, miscellaneous parameters, TCLP Analysis for select VOCs, SVOCs, and metals, and grain size distribution.

1.5.2 Inactive Hazardous Waste Sites

A total of five inactive hazardous waste sites exist in the vicinity of Glen Cove Creek. These sites are listed below:

- Konica (also known as Powers Chemco or Columbia Ribbon and Carbon Manufacturing Company)
- Li Tungsten (formerly Wah Chang Smelting and Refining Company)
- Mattiace Petrochemical
- Captain's Cove
- Edmos Corporation
- Crown Dykeman

The locations of several of these facilities are illustrated in the Vibracore Sampling Location Map (Dvirka and Bartilucci, 1996), which is provided in Appendix A.

The New York State Department of Environmental Conservation (NYSDEC) has designated four state Superfund sites in the Glen Cove Creek area: Captain's Cove, Crown Dykeman, Konica (Powers Chemco), and Edmos Corporation. The Captain's Cove and Crown Dykeman sites are currently undergoing investigative activities. The Konica and Edmos Corporation sites are currently undergoing remediation activities.

The Li Tungsten and Mattiace Petrochemical Properties have been designed as Federal Superfund sites by the U.S. Environmental Protection Agency (USEPA). Remediation activities are currently being conducted at these sites.

1.5.2.1 Mattiace Petrochemical – Glen Cove Creek Sampling

A report was developed in 1998 entitled *"Mattiace Petrochemical Site, Glen Cove Creek Sampling in Support of the Residual Investigation (RI) at the Mattiace Petrochemical Site Sediment and Surface Water Sampling"*(Foster-Wheeler, 1998). According to the report, sampling activities were conducted in 1989, 1991, 1995, and 1998 at various locations within Glen Cove Creek. The samples were analyzed for VOCs, SVOCs, Pesticides/PCBs, tungsten, and TAL metals.

The conclusion of the report indicated the following:

- A general decreasing trend in contaminant concentrations was evident, due wholly or in part by dredging activity conducted within Glen Cove Creek.
- The metals of concern were identifies as arsenic, cadmium, cobalt, and mercury with fluctuating levels. Metals concentrations were generally higher in the upgradient samples.
- A significant reduction in the total number and concentrations of VOCs were noted since the initial 1989 sampling event.

- A significant decreasing trend in the number and concentrations of SVOCs was noted. However, an increase in SVOCs was noted in the upgradient samples (near the Li Tungsten facility). Most of the SVOCs were typical constituents of petroleum products or components of plastic/carrier bases of pigments/paints. Foster-Wheeler

assumed that the sources of the SVOCs were from non-point source activities and/or past releases.
- In general, most pesticides exhibited reductions in concentration levels over time
- PCBs were detected in the upgradient sample locations during the 1998 sampling event.

1.6 PROJECT OBJECTIVES

The overall intent of the Glen Cove Creek Brownfields Plan is to accomplish the following goals:

1. Determine the analytical and spatial extent of potential Brownfields contamination adjacent to Glen Cove Creek, including Mill Pond;

2. Determine the degree to which Brownfields contamination contributes to degraded environmental conditions within Glen Cove Creek, via analysis of bedload and suspended sediment transport processes; and

3. Coordinate with the City of Glen Cove and its consultants, presently working to reduce sedimentation and nitrogen loading of Mill Pond, to recommend future actions to facilitate reuse of the waterfront as described in the Glen Cove Creek Revitalization Plan.

The scope of work (SOW) for this project is to accomplish the first two goals referenced above. In order to accomplish this SOW, the project tasks were as follows:

- conduct limited Hazardous and Toxic Waste (HTW) sampling
- perform sediment transport and sediment budget analyses
- prepare a Brownfields Site Assessment Report based on the data collected.

The sediment transport and sediment budget analysis was performed by Kupper Associates. Information relative to this effort is provided in *Sediment Transport and Sediment Budget Analysis, Glen Cove Creek Brownfields Site Assessment, Glen Cove, New York,* BVA/Kupper, October 2000.

SECTION 2
LIMITED HAZARDOUS AND TOXIC WASTE (HTW) SAMPLING ACTIVITIES

2.1 SCOPE OF SAMPLING ACTIVITIES

The purpose of the limited HTW sampling was to fill data gaps and assess the role of adjacent Brownfields sites in the deterioration of environmental conditions within Glen Cove Creek. This sampling effort focused on the dogleg area of Glen Cove Creek, Mill Pond, and the soils immediately surrounding the dogleg and Mill Pond.

The sampling effort was focused on the following three media:

- Sediments within the dogleg and Mill Pond
- Combined surface water/sediment from the four outfalls within the dogleg and the Cedar Swamp Creek outfall within Mill Pond
- Soil on the side slopes of the dogleg and Mill Pond, as well as soils immediately adjacent to the eastern and southern bulkheads in the dogleg.

Mill Pond is heavily silted, causing preferential water pathways within the pond. Since the siltation of Mill Pond was a result of sediment deposition, all samples taken within the footprint of the pond, excluding the side slopes, are considered to be sediment samples.

The sampling activities were based on the procedures provided in the *Glen Cove Creek Brownfields Site Assessment Work Plan, Glen Cove, New York (BVA 1999).* For the limited HTW sampling activities, the Work Plan detailed the collection of twenty-five (25) routine samples. The Work Plan differentiated the samples as follows:

- 5 surface water/sediment samples at outfalls (4 in the dogleg and 1 in Mill Pond)
- 10 soil samples adjacent to the dogleg and Mill Pond
- 10 sediment samples within the dogleg and Mill Pond

The following subsections detail the field activities, analytical requirements, and QA/QC activities performed during the sampling effort.

2.2 SUMMARY OF SAMPLING ACTIVITIES

2.2.1 Field Activities

Sampling activities were conducted on February 14-17, 2000. The sampling activities consisted of the collection of surface water/sediment samples at five outfalls, sediment samples at various locations within Mill Pond and the dogleg, and soil samples on the embankments surrounding Mill Pond and the dogleg.

On February 14, 2000, CAPE personnel identified the appropriate locations for the soil and sediment samples. The sample locations were identified using pin flags and/or stakes, and the locations were maintained so that they could be surveyed. Mark Lulka of the USACE – NYD assisted CAPE in the location of the samples and reviewed the location strategy with City of Glen Cove personnel.

For the remainder of the field effort CAPE personnel collected the samples and performed sample packaging and shipment activities. The samples were sent to STL Laboratories in Savannah, GA for analysis. The sediment samples that were collected in the dogleg were collected during low tide to facilitate collection.

On February 16-17, 2000, surveyors from Kupper and Associates (Kupper) mobilized to the site and surveyed the sample locations. A copy of the survey plat is provided in Appendix B.

The sample location rationale and any field observations in and around the sample locations are provided in the following subsection.

2.2.2 Sample Location Rationale

A total of twenty-five (25) routine samples were collected during the sampling effort. The samples were differentiated as follows:

- 5 surface water/sediment samples at outfalls (4 in the dogleg and 1 in Mill Pond)
- 9 soil samples adjacent to the dogleg and Mill Pond
- 11 sediment samples within the dogleg and Mill Pond

One sediment sample, GC-SED-14, was compromised in shipment; therefore, no analysis is available for this sample.

The soil and sediment sample locations are illustrated on the survey plat provided in Appendix A. The rationale for the final sample locations is provided in the following subsections.

2.2.2.1 Outfall Samples

Five surface water/sediment combined matrix samples were obtained at the outfalls in the project area. The sample location rationale is provided below:

- Sample SED-01 was collected immediately below the outfall located in the southern portion of the dogleg. This outfall discharges water from a storm sewer within the bulkhead on the south side of the dogleg.
- Sample SED-02 was collected immediately below the outfall in the southeastern end of the dogleg. This outfall is the overflow spillway from Mill Pond. The sample was collected in the sediment deposition area immediately west of the concrete spillway.
- Sample SED-03 was collected immediately downstream of the old outfall located in the northeastern end of the dogleg. The outfall is the old spillway for Mill Pond. Although the spillway has been decommissioned, it was observed that some water from Mill Pond has developed a flow pathway underneath the decommissioned spillway. CAPE observed miscellaneous debris, including discarded masonry, old bicycles, and trash throughout this area of the dogleg.
- Sample SED-04 was collected below the outfall that originates from the slope at the northern end of the dogleg. According to Glen Cove personnel, this outfall is a storm sewer originating from the Konica facility north of the dogleg. Since rocks impede sediment deposition immediately below the outfall pipe, this sample was collected approximately 20 ft from the outfall within the dogleg sediments.
- Sample SED-05 will be collected in the sediment deposition area immediately downgradient of the Cedar Swamp Creek outfall flowing into Mill Pond.

2.2.2.2 Sediment Samples

A total of eleven (11) sediment samples were collected from the dogleg and Mill Pond. Although the Work Plan initially called for 10 sediment samples to be obtained, a decision was made in the field to eliminate one surface soil sample and collect one additional sediment sample from Mill Pond. The sample location rationale is provided below:

- Samples SED-06, SED-07, SED-08, and SED-09 were collected from the sediment within the dogleg. The samples were collected in locations that produced a spatial representation of sediments within the dogleg as shown in the survey plat in Appendix B. The samples were collected at low tide. Samples SED-06 and SED-07 were collected from exposed sediment and samples SED-08 and SED-09 were collected below the water line.
- Samples SED-10, SED-11, SED-12, SED-13, SED-14, SED-15, and SED-16 were collected within the sediments of Mill Pond. Samples were collected from the

preferential stream pathways and from the forested wetlands within Mill Pond footprint. Various locations within Mill Pond contained discarded trash and debris, and several of the samples were biased to these areas.

2.2.2.3 Soil Samples

Nine soil samples were obtained from the soils surrounding Mill Pond and the dogleg. The sample location rationale is provided below:

- Sample SS-01, designated as a background sample for the project, was collected from the open park area immediately northwest of Mill Pond.
- Sample SS-02 was collected from the soil immediately south of the southern bulkhead in the dogleg. Various construction debris was located in this area at the time of sample collection.
- Samples SS-03 and SS-04 were collected from the soil adjacent to the eastern end of the dogleg. The samples were collected in the area between the dogleg bulkhead and Charles Street. Observations during site visits in September 1999 and February 2000 indicated that this area has been used for the temporary storage of fill material, construction, and asphalt debris.
- Samples SS-05 and SS-06 were collected from the soil along the side slope at the northern end of the dogleg. Evidence of dumping along the slope was apparent in February 2000. Sample SS-06 was collected immediately beneath an area of paint spillage along the slope (discolored vegetation evident).
- Sample SS-07 was collected on the side slope of Mill Pond northeast of the spillway.
- Sample SS-08 was collected on the northeast side slope of Mill Pond off of Herb Hill Road. This sample location was selected due to evidence of dumping in this area.
- Sample SS-09 was collected on the southern side slope of Mill Pond behind the fire station. Evidence of dumping was apparent in this area.

2.2.2.4 Quality Assurance/Quality Control (QA/QC) Samples

QA/QC samples were collected and analyzed in accordance with the Work Plan. The following QA/QC samples were collected during the sampling effort.

- Three duplicate samples, based on one duplicate sample per ten routine samples
- Three equipment blank samples, based on one equipment blank per day of sampling activities
- Five trip blank samples, based on one trip blank per cooler
- Two matrix spike samples, based on one matrix spike sample per twenty routine samples

- Two matrix spike duplicate samples, based on one matrix spike duplicate sample per twenty routine samples

The Work Plan stated that QA split samples would be collected and shipped to the USACE–New England District Laboratory for analysis. However, the USACE – NYD determined that QA split samples were not necessary for this project.

2.3 SAMPLING PROCEDURES

The samples were collected based on the procedures outlined in the Work Plan, with modifications performed in the field based on site constraints. A brief description of the sampling procedures in relation to each type of sample is provided in the following subsections.

2.3.1 Outfalls

The samples at outfalls in the dogleg and Mill Pond were collected using a decontaminated stainless steel scoop and bowl. For VOC samples, the sediments were immediately placed into laboratory-cleaned, laboratory-supplied glass containers. The stainless steel bowl was used for non-VOC sample collection so that sufficient quantity of sediment could be obtained prior to placement into sample containers. The samples were collected from the bottom of the water column to a depth of 6 inches into the sediments.

The samples within the dogleg were collected during the low tide period for the week of February 14, 2000, as predicted by National Oceanic and Atmospheric Administration (NOAA) for Willets Point, New York, which is the closest NOAA survey point to Glen Cove, New York.

2.3.2 Sediment

The four sediment samples within the dogleg area were also collected using a decontaminated stainless steel scoop. The samples were collected during NOAA predicted low tide periods.

Seven sediment samples within the Mill Pond were collected using decontaminated stainless steel spoon. The top 2-3" surface at each sampling location was removed and then the sediment sample was collected with a decontaminated stainless steel scoop and placed directly into laboratory-cleaned, laboratory-supplied glass containers.

2.3.3 Soils

Each soil sample location was hand augured using a decontaminated stainless steel auger to remove the top 9 inches of soils. An AMS® core sampler lined with a Butyrate liner was then placed into the borehole and driven using AMS® slide hammer. The sampler was hammered down incrementally to a depth of 1.5 ft. bgs and then carefuly removed from the ground.

ENCORE® samples for volatile organic compound (VOC) analyses were collected per the NYSDEC regulations directly from the butyrate liner. The remaining soils inside the Butyrate liner were then transferred into a decontaminated stainless steel bowl, mixed thoroughly, then placed into laboratory-cleaned, laboratory-supplied glass containers.

All soil and sediment samples were carefully packed and shipped each day via courier to STL Laboratories, Inc.

2.3.4 Sample Descriptions

The following table is a brief summary of the sample descriptions for each sample that was collected.

Sample ID#	Sample Location	Sample Description
GC-SS-01	Upgradient of Mill Pond	Dark brown sandy clay with some cobbles, moist
GC-SS-02	Adjacent to south end of dogleg	Brown to black fine to coarse sand, moist
GC-SS-03	Adjacent to eastern end of dogleg	Brown to black fine to coarse sand, moist
GC-SS-04	Adjacent to eastern end of dogleg	Dark brown fine to coarse sand, moist
GC-SS-05	Adjacent to northern end of dogleg	Brown to black clay and fine sand
GC-SS-06	Adjacent to northern end of dogleg	Brown to black clay and fine sand
GC-SS-07	Slopes surrounding Mill Pond	Tan fine to medium sand with sheen of oil
GC-SS-08	Slopes surrounding Mill Pond	Dark brown to black, clay and some fine sand
GC-SS-09	Slopes surrounding Mill Pond	Brown sandy clay with organic matter
GC-SED-01	Southern outfall in dogleg	Brown to black fine to medium sand with sheen of oil
GC-SED-02	Southeastern outfall in dogleg	Brown to black fine to medium sand with sheen of oil
GC-SED-03	Southeastern outfall in dogleg	Brown to black fine to medium sand with sheen of oil
GC-SED-04	Southeastern outfall in dogleg	Brown to black fine to medium sand with sheen of oil

Sample ID#	Sample Location	Sample Description
GC-SED-05	Outfall of creek feeding Mill Pond	Brown fine to coarse sand with some river rock
GC-SED-06	Within dogleg	Dark brown to black silty clay with green discoloration
GC-SED-07	Within dogleg	Dark brown to black silty clay
GC-SED-08	Within dogleg	Dark brown to black sandy clay coarse sand with some rock
GC-SED-09	Within dogleg	Dark brown to black sandy clay coarse sand with some rock
GC-SED-10	Within Mill Pond	Tan to brown fine to coarse sand
GC-SED-11	Within Mill Pond	Black silty clay fine to coarse sand with organic matter
GC-SED-12	Small northwestern outfall within Mill Pond	Black silty clay fine to coarse sand
GC-SED-13	Small northeastern outfall within Mill Pond	Black silty clay fine to coarse sand
GC-SED-14	Within Mill Pond	Black silty clay coarse sand to river rock, oil sheen noted
GC-SED-15	Within Mill Pond	Black silty clay coarse sand to river rock
GC-SED-16	Within Mill Pond	Black silty clay fine to coarse sand high in organic matter

2.4 ANALYTICAL REQUIREMENTS

STL Laboratories, Inc. of Savannah, Georgia performed the chemical sample analysis. The grain size distribution analysis was performed by Thompson Engineering in Mobile, Alabama under subcontract to STL Laboratories, Inc.

All soil and sediment samples were analyzed for the following:

- Volatile Organic Compounds (VOCs) using EPA Method 8260
- Semi-volatile Organic Compounds (SVOCs) using EPA Method 8270
- Pesticides/polychlorinated biphenyl's (PCBs) using EPA Method 8081 and 8082
- Target Analyte List (TAL) Metals using EPA Method 6010
- Mercury using EPA Method 7471
- Toxicity Characteristic Leaching Procedure (TCLP) Metals using EPA Method 6010
- Mercury in TCLP Extract using EPA Method 7470

Sediment samples were also analyzed for fecal coliform and Nitrate/Nitrite using EPA Method CE-81-1.

Soil samples were collected for grain size distribution (Sieve Analysis) by ASTM D-422.

2.5 DECONTAMINATION/IDW

All field sampling equipment was decontaminated each day prior to beginning of the sampling efforts. Decontamination consisted of scrubbing the sampling equipment with a solution of Alconox and water, rinsing with potable water, rinsing with pesticide grade Isopropyl alcohol, rinsing with deionized water and air drying the equipment. Surgical latex gloves were worn during decontamination.

Because of the small quantity generated, CAPE handled the disposal of this IDW.

SECTION 3
LABORATORY ANALYTICAL RESULTS

The soil and sediment analytical data summary tables, which contain the analytical results for the sampling effort, are presented in Tables 1 through 8. The contents of each table are presented below:

- Table 1 – Volatile Organic Compounds (VOCs) data for Soil Samples GC-SS-01 through GC-SS-09.
- Table 2 – Semi-volatile Organic Compounds (SVOCs) and Pesticide/PCB data for Soil Samples GC-SS-01 through GC-SS-09.
- Table 3 – TAL Metals and TCLP Metals data for Soil Samples GC-SS-01 through GC-SS-09.
- Table 4 – Volatile Organic Compounds (VOCs) data for Sediment Samples GC-SED-01 through GC-SED-13, GC-SED-15 and GC-SED-16.
- Table 5 – Semi-volatile Organic Compounds (SVOCs) and Pesticide/PCB data for Sediment Samples GC-SED-01 through GC-SED-13, GC-SED-15 and GC-SED-16.
- Table 6 – TAL Metals and TCLP Metals data for Sediment Samples GC-SED-01 through GC-SED-13, GC-SED-15 and GC-SED-16.
- Table 7 – Nitrite/Nitrate and Fecal Coliform data for Sediment Samples GC-SED-01 through GC-SED-13, GC-SED-15 and GC-SED-16.
- Table 8 – Sieve Analysis data for Soil Samples GC-SS-01 through GC-SS-09.

As discussed previously, sediment sample GC-SED-14 was compromised. Therefore, laboratory analytical results are not available for this sample.

The laboratory data packages for this sampling effort are included in Appendix C. Data validation on the analytical result was performed by Meridian Science and Technology, Inc. (MSTI) of Columbia, MD.

TABLES

TABLE 1
SOIL ANALYTICAL DATA SUMMARY – VOCs
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

TABLE 1
SOIL ANALYTICAL DATA SUMMARY-VOCs
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID / Date	GC-SS-01 15-Feb-00	GC-SS-02 15-Feb-00	GC-SS-03 15-Feb-00	GC-SS-04 16-Feb-00	GC-SS-05 16-Feb-00	GC-SS-06 16-Feb-00	GC-SS-07 15-Feb-00	GC-SS-08 16-Feb-00	GC-SS-09 16-Feb-00
VOC's EPA Method 8260	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1,1-Trichloroethane	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
1,1,2,2-Tetrachloroethane	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
1,1,2-Trichloroethane	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
1,1-Dichloroethane	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
1,1-Dichloroethene	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
1,2-Dichloroethane	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
1,2-Dichloropropane	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
2-Butanone (MEK)	<9.9	<11	<10	<10	<11	<9.5	<10	<18	<12
2-Hexanone	<9.9	<11	<10	<10	<11	<9.5	<10	<18	<12
4-Methyl-2-pentanone (MIBK)	<9.9	<11	<10	<10	<11	<9.5	<10	<18	<12
Acetone	**21**	<27	B **23**	**69**	**28**	**17**	B **32**	**34**	**24**
Benzene	<2.0	B **38**	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Bromodichloromethane	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Bromoform	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Bromomethane (Methyl bromide)	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Carbon disulfide	<2.0	<2.2	B **4.1**	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Carbon tetrachloride	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Chlorobenzene	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Chloroethane	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Chloroform	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Chloromethane	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Cis/Trans-1,2-Dichloroethene	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
cis-1,3-Dichloropropene	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Dibromochloromethane	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Ethylbenzene	<2.0	B **4.8**	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Methylene chloride (Dichloromethane)	<2.0	<2.2	<2.1	<5.2	<5.5	<4.7	<2.0	<8.9	<2.4
Styrene	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Tetrachloroethene	<2.0	B **8.6**	<2.1	B **2.4**	**4.2**	<1.9	<2.0	<3.6	<2.4
Toluene	<2.0	**22**	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
trans-1,3-Dichloropropene	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Trichloroethene	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Vinyl chloride	<2.0	<2.2	<2.1	<2.1	<2.2	<1.9	<2.0	<3.6	<2.4
Xylenes, Total	**3.9**	B **32**	**5.2**	<4.2	<4.4	<3.8	<4.0	<7.2	<4.7

Notes:

ug/kg = micrograms per kilogram; mg/l = milligrams per liter; mg/kg = milligrams per kilogram.

Bold type indicate analytical results above laboratory reporting limits. The superscript indicates the screening levels that were exceeded:

B= Background sample readings; R = EPA Region 3 Human health RBCs for industrial use scenario

T=NYSDEC TAGM Recommended soil cleanup levels

TABLE 2
SOIL ANALYTICAL DATA SUMMARY – SVOCs, PESTICIDES AND PCBs
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

TABLE 2
SOIL ANALYTICAL DATA SUMMARY SVOCs, PESTICIDES AND PCBs
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID	GC-SS-01	GC-SS-02	GC-SS-03	GC-SS-04	GC-SS-05	GC-SS-06	GC-SS-07	GC-SS-08	GC-SS-09
Date	15-Feb-00	15-Feb-00	15-Feb-00	16-Feb-00	16-Feb-00	16-Feb-00	15-Feb-00	16-Feb-00	16-Feb-00
SVOC's									
EPA Method 8270	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
2,2'-Oxybis(1-Chloropropane)	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
2,4,5-Trichlorophenol	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
2,4,6-Trichlorophenol	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
2,4-Dichlorophenol	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
2,4-Dimethylphenol	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
2,4-Dinitrophenol	< 3,800	< 1,900	< 3,800	< 2,000	< 1,900	< 1,800	< 3,700	< 2,600	< 2,500
2-Chloronaphthalene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
2-Chlorophenol	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
2-Methylnaphthalene	**920**	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
2-Methylphenol (o-cresol)	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
2-Nitroaniline	< 3,800	< 1,900	< 3,800	< 2,000	< 1,900	< 1,800	< 3,700	< 2,600	< 2,500
2-Nitrophenol	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
3-Methylphenol/4-Methylphenol	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
3-Nitroaniline	< 3,800	< 1,900	< 3,800	< 2,000	< 1,900	< 1,800	< 3,700	< 2,600	< 2,500
4,6-Dinitro-2-methylphenol	< 3,800	< 1,900	< 3,800	< 2,000	< 1,900	< 1,800	< 3,700	< 2,600	< 2,500
4-Bromophenylphenyl ether	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
4-Chloro-3-methylphenol	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
4-Chloroaniline	< 1,500	< 720	< 1,500	< 770	< 750	< 720	< 1,400	< 1,000	< 970
4-Chlorophenylphenyl ether	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
4-Nitroaniline	< 3,800	< 1,900	< 3,800	< 2,000	< 1,900	< 1,800	< 3,700	< 2,600	< 2,500
4-Nitrophenol	< 3,800	< 1,900	< 3,800	< 2,000	< 1,900	< 1,800	< 3,700	< 2,600	< 2,500
Acenaphthene	[R] **2200**	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Acenaphthylene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Anthracene	**3600**	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Benzo(a)anthracene	[T] **7900**	< 360	[T] **1100**	< 380	< 790	< 360	< 720	< 500	< 480
Benzo(a)pyrene	< 7,000	< 360	[RT] **990**	< 380	< 760	< 360	< 720	< 500	< 480
Benzo(b)fluoranthene	[T] **7600**	< 360	**740**	< 380	< 690	< 360	< 720	< 500	< 560
Benzo(g,h,i)perylene	**3700**	< 360	< 730	< 380	< 480	< 360	< 720	< 500	< 480
bis(2-Chloroethoxy)methane	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
bis(2-Chloroethyl)ether	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
bis(2-Ethylhexyl)phthalate	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Butylbenzylphthalate	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Diethylphthalate	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Pentachlorophenol	< 3,800	< 1,900	< 3,800	< 2,000	< 1,900	< 1,800	< 3,700	< 2,600	< 2,500
Phenol	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480

Notes:

ug/kg = micrograms per kilogram; mg/l = milligrams per liter; mg/kg = milligrams per kilogram.

Bold type indicate analytical results above laboratory # reporting limits. The superscript indicates the screening levels that were exceeded:

B= Background sample readings; R = EPA Region 3 Human health RBCs for industrial use scenario;

T=NYSDEC TAGM Recommended soil cleanup levels

TA[illegible]E 2

SOIL ANALYTICAL DATA SUMM[illegible]SVOCs, PESTICIDES AND PCBs

GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

Glen Cove, New York

Sample ID Date	GC-SS-01 15-Feb-00	GC-SS-02 15-Feb-00	GC-SS-03 15-Feb-00	GC-SS-04 16-Feb-00	GC-SS-05 16-Feb-00	GC-SS-06 16-Feb-00	GC-SS-07 15-Feb-00	GC-SS-08 16-Feb-00	GC-SS-09 16-Feb-00
1,2,4-Trichlorobenzene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
1,2-Dichlorobenzene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
1,3-Dichlorobenzene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
1,4-Dichlorobenzene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
2,4-Dinitrotoluene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
2,6-Dinitrotoluene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
3,3'-Dichlorobenzidine	< 1,500	< 720	< 1,500	< 770	< 750	< 720	< 1,400	< 1,000	< 970
Benzo(k)fluoranthene	T **4800**	< 360	< 1,100	< 380	< 670	< 360	< 720	< 500	< 540
Carbazole	**1600**	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Chrysene	T **8100**	< 360	< 1,200	< 400	< 890	< 360	< 720	< 500	< 530
Dibenzo(a,h)anthracene	RT **1500**	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Dibenzofuran	**1700**	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Dimethylphthalate	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Di-n-butylphthalate	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Di-n-octylphthalate	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Fluoranthene	**20000**	< 360	< 2,300	< 500	< 1,600	< 360	< 720	< 500	< 790
Fluorene	**2000**	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Hexachlorobenzene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Hexachlorobutadiene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Hexachlorocyclopentadiene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Hexachloroethane	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Indeno(1,2,3-cd)pyrene	RT **3500**	< 360	< 730	< 380	< 510	< 360	< 720	< 500	< 480
Isophorone	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Naphthalene	**2100**	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Nitrobenzene	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
N-Nitroso-di-n-propylamine	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
N-Nitrosodiphenylamine/Diphenylamine	< 730	< 360	< 730	< 380	< 380	< 360	< 720	< 500	< 480
Phenanthrene	**20000**	< 360	< 2,000	< 400	< 1,400	< 360	< 720	< 500	< 480
Pyrene	**17000**	< 360	< 2,300	< 580	< 1,800	< 360	< 720	< 570	< 750

Notes:

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Bold type indicate analytical results above laboratory reporting limits. The superscript indicates the screening levels that were exceeded:

B= Background sample readings; R = EPA Region 3 Human health RBCs for industrial use scenario;

T=NYSDEC TAGM Recommended soil cleanup levels

TA[illegible]E 2
SOIL ANALYTICAL DATA SUMM[illegible] SVOCs, PESTICIDES AND PCBs
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID	GC-SS-01	GC-SS-02	GC-SS-03	GC-SS-04	GC-SS-05	GC-SS-06	GC-SS-07	GC-SS-08	GC-SS-09
Date	15-Feb-00	15-Feb-00	15-Feb-00	16-Feb-00	16-Feb-00	16-Feb-00	15-Feb-00	16-Feb-00	16-Feb-00
Pesticides/PCB									
EPA Method 8081	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4,4'-DDD	< 18.0	< 3.6	< 3.7	< 3.8	< 3.7	< 3.6	< 3.6	< 71	< 11
4,4'-DDE	< 18.0	< 3.6	< 3.7	< 2.7	< 3.7	< 3.6	< 3.6	< 13	< 8
4,4'-DDT	< 18.0	< 3.6	< 5.4	< 7.8	< 3.7	< 3.6	< 3.6	< 45	< 11
Aldrin	< 9.6	< 1.8	< 1.9	< 2.0	< 1.9	< 1.8	< 1.9	< 13	< 3
alpha-BHC	< 9.6	< 1.8	< 1.9	< 2.0	< 1.9	< 1.8	< 1.9	< 13	< 3
beta-BHC	< 11.0	< 1.8	< 1.9	< 2.0	< 11.0	< 1.8	< 1.9	< 13	< 3
Chlordane (technical)	< 96.0	< 18.0	< 19.0	< 20.0	< 19.0	< 18.0	< 19.0	< 130	< 25
delta-BHC	< 9.6	< 1.8	< 1.9	< 2.0	< 1.9	< 1.8	< 1.9	< 13	< 3
Dieldrin	< 18.0	< 3.6	< 3.7	< 8.9	< 3.7	< 3.6	< 3.6	< 25	< 5
Endosulfan I	< 9.6	< 1.8	< 1.9	< 2.0	< 1.9	< 1.8	< 1.9	< 13	< 3
Endosulfan II	< 18.0	< 3.6	< 3.7	< 3.8	< 3.7	< 3.6	< 3.6	< 25	< 5
Endosulfan sulfate	< 18.0	< 3.6	< 3.7	< 3.8	< 3.7	< 3.6	< 3.6	< 25	< 5
Endrin	< 18.0	< 3.6	< 3.7	< 3.8	< 3.7	< 3.6	< 3.6	< 25	< 5
Endrin aldehyde	< 18.0	< 3.6	< 3.7	< 3.8	< 3.7	< 3.6	< 3.6	< 25	< 5
gamma-BHC (Lindane)	< 9.6	< 1.8	< 1.9	< 2.0	< 1.9	< 1.8	< 1.9	< 13	< 3
Heptachlor	< 9.6	< 1.8	< 1.9	< 2.0	< 1.9	< 1.8	< 1.9	< 13	< 3
Heptachlor epoxide	< 9.6	< 1.8	< 1.9	< 2.0	< 1.9	< 1.8	< 1.9	< 13	< 3
Methoxychlor	< 96.0	< 18.0	< 19.0	< 20.0	< 19.0	< 18.0	< 19.0	< 130	< 25
Toxaphene	< 960.0	< 180.0	< 190.0	< 200.0	< 190.0	< 180.0	< 190.0	< 1,300	< 250
PCB									
EPA Method 8082	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Aroclor-1016	< 180	< 36	< 37	< 38	< 37	< 36	< 36	< 250	< 48
Aroclor-1221	< 380	< 73	< 74	< 78	< 76	< 73	< 74	< 510	< 98
Aroclor-1232	< 180	< 36	< 37	< 38	< 37	< 36	< 36	< 250	< 48
Aroclor-1242	< 180	< 36	< 37	< 38	< 37	< 36	< 36	< 250	< 48
Aroclor-1248	< 180	< 36	< 37	< 38	< 37	< 36	< 36	< 250	< 48
Aroclor-1254	< 180	< 36	< 37	< 38	< 37	< 36	< 36	< 250	< 48
Aroclor-1260	< 180	< 36	< 37	< 38	< 37	< 36	< 36	< 250	< 48

Notes:

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B= Background sample readings; R = EPA Region 3 Human health RBCs for industrial use scenario;

T=NYSDEC TAGM Recommended soil cleanup levels

TABLE 3
SOIL ANALYTICAL DATA SUMMARY – TAL METALS, TCLP METALS
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

TABLE 3
SOIL ANALYTICAL DATA SUMMARY-TAL METALS, TCLP METALS
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID	GC-SS-01	GC-SS-02	GC-SS-03	GC-SS-04	GC-SS-05	GC-SS-06	GC-SS-07	GC-SS-08	GC-SS-09
Date	15-Feb-00	15-Feb-00	15-Feb-00	16-Feb-00	16-Feb-00	16-Feb-00	15-Feb-00	16-Feb-00	16-Feb-00
TAL Metals									
EPA Method 6010	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	4200	3200	3100	4600	6300	4000	2900	6800	8800
Antimony	<2.2	<2	<2	<2.4	<2.1	< 2.2	<2	< 2.8	< 2.7
Arsenic	R 5	3	6	RT 13	R 5.7	6.5	4.2	RT 10	9.1
Barium	49	42	35	52	50	27	25	59	79
Beryllium	<0.45	<0.4	<0.41	<0.47	<0.42	< 0.4	<0.4	< 0.56	<0.53
Cadmium	0.66	<0.5	0.54	T 1.3	<0.52	< 0.55	<0.5	T 1.4	1.1
Calcium	480	680	1300	4200	780	390	280	5200	7800
Chromium	T 11	6.6	T 11	18	16	13	7.5	T 26	30
Cobalt	4.1	2.5	5.6	6.1	5.3	3.6	2.4	5.1	8
Copper	21	11	T 42	63	26	14	6.2	T 110	120
Iron	8300	6600	9900	11000	13000	8100	5500	11000	18000
Lead	110	32	140	140	88	71	14	T 1100	420
Magnesium	940	770	1300	3000	1600	910	560	3800	4100
Manganese	130	560	110	130	180	150	110	110	490
Nickel	7	4.7	6.1	12	13	7	4.3	29	23
Potassium	590	320	600	550	740	460	270	530	590
Selenium	<1.1	<1	<1	1.5	1.2	< 1.1	<1	< 1.4	1.6
Silver	<1.1	<1	5.6	17	<1	<1.1	<1	< 1.4	<1.3
Sodium	<56	<50	54	59	100	67	<50	150	190
Thallium	<1.1	<1	<1	<1.2	<1	< 1.1	<1	< 1.4	< 1.3
Vanadium	17	8.8	11	19	20	16	9	45	35
Zinc	46	27	T 81	92	140	44	17	T 560	210
Mercury									
EPA Method 7471	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Mercury	0.16	0.04	0.11	0.19	0.15	0.11	0.039	0.43	0.35

Notes:

ug/kg = micrograms per kilogram; mg/l = milligrams per liter; mg/kg = milligrams per kilogram.

Bold type indicate analytical results above laboratory reporting limits. The superscript indicates the screening levels that were exceeded:

B= Background sample readings; R = EPA Region 3 Human health RBCs for industrial use scenario;

T=NYSDEC TAGM Recommended soil cleanup levels

TABLE 3
SOIL ANALYTICAL DATA SUMMARY-TAL METALS, TCLP METALS
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID Date	GC-SS-01 15-Feb-00	GC-SS-02 15-Feb-00	GC-SS-03 15-Feb-00	GC-SS-04 16-Feb-00	GC-SS-05 16-Feb-00	GC-SS-06 16-Feb-00	GC-SS-07 15-Feb-00	GC-SS-08 16-Feb-00	GC-SS-09 16-Feb-00

Sample ID Date	GC-SS-01 15-Feb-00	GC-SS-02 15-Feb-00	GC-SS-03 15-Feb-00	GC-SS-04 16-Feb-00	GC-SS-05 16-Feb-00	GC-SS-06 16-Feb-00	GC-SS-07 15-Feb-00	GC-SS-08 16-Feb-00	GC-SS-09 16-Feb-00
TCLP Metals									
EPA Method 6010	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Arsenic	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Barium	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Cadmium	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chromium	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Lead	< 0.20	< 1.00	< 0.20	< 0.20	< 0.25	< 0.20	< 0.20	< 0.23	< 0.20
Selenium	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Silver	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Mercury In TCLP Extract									
EPA Method 7470	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Mercury (TCLP)	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020

ug/kg = micrograms per kilogram; mg/l = milligrams per liter; mg/kg = milligrams per kilogram.
Bold type indicate analytical results above laboratory reporting limits. The superscript indicates the screening levels that were exceeded:
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TABLE 4

SEDIMENT ANALYTICAL DATA SUMMARY – VOCs

GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

TABLE 4
SEDIMENT ANALYTICAL DATA SUMMARY-VOCs
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID	GC-SED-01	GC-SED-02	GC-SED-03	GC-SED-04	GC-SED-05	GC-SED-06	GC-SED-07
Date	16-Feb-00	16-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	16-Feb-00
VOC's							
EPA Method 8260	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1,1-Trichloroethane	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
1,1,2,2-Tetrachloroethane	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
1,1,2-Trichloroethane	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
1,1-Dichloroethane	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
1,1-Dichloroethene	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
1,2-Dichloroethane	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
1,2-Dichloropropane	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
2-Butanone (MEK)	< 12.0	< 10.0	B **34**	**51**	< 10.0	< 14.0	< 13.0
2-Hexanone	< 12.0	< 10.0	< 26.0	< 15.0	< 10.0	< 14.0	< 13.0
4-Methyl-2-pentanone (MIBK)	< 12.0	< 10.0	< 26.0	< 15.0	< 10.0	< 14.0	< 13.0
Acetone	B **44**	**21**	B T **220**	**290**	**47**	B **72**	**64**
Benzene	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
Bromodichloromethane	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
Bromoform	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
Bromomethane (Methyl bromide)	< 2.3	< 2.1	< 5.2	< 6.0	< 2.1	< 5.4	< 2.6
Carbon disulfide	B **4.2**	**4.8**	**51**	< 3.0	< 2.1	B **20**	**3**
Carbon tetrachloride	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
Chlorobenzene	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
Chloroethane	< 2.3	< 2.1	< 5.2	< 6.0	< 2.1	< 5.4	< 2.6
Chloroform	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
Chloromethane	< 2.3	< 2.1	< 5.2	< 6.0	< 2.1	< 5.4	< 2.6
Cis/Trans-1,2-Dichloroethene	B **3.5**	< 2.1	< 5.2	< 3.0	B **9.7**	< 2.7	< 2.6
cis-1,3-Dichloropropene	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
Dibromochloromethane	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
Ethylbenzene	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
Methylene chloride (Dichloromethane)	< 5.8	< 5.2	< 13.0	< 3.0	< 5.2	< 2.7	< 6.6
Styrene	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
Tetrachloroethene	< 2.3	< 2.1	< 5.2	< 3.0	B **67**	< 2.7	< 2.6
Toluene	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
trans-1,3-Dichloropropene	< 2.3	< 2.1	< 5.2	< 3.0	< 2.1	< 2.7	< 2.6
Trichloroethene	< 2.3	< 2.1	< 5.2	< 3.0	B **9.1**	< 2.7	< 2.6
Vinyl chloride	< 2.3	< 2.1	< 5.2	< 6.0	< 2.1	< 5.4	< 2.6
Xylenes, Total	< 4.7	< 4.2	< 10.0	< 6.0	< 4.2	< 5.4	< 5.3

Notes:

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B= Background sample readings; R = EPA Region 3 Human health RBCs for industrial use scenario;

T=NYSDEC TAGM Recommended soil cleanup levels

TABLE 4
SEDIMENT ANALYTICAL DATA SUMMARY-VOCs
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID	GC-SED-08	GC-SED-09	GC-SED-10	GC-SED-11	GC-SED-12	GC-SED-13	GC-SED-15	GC-SED-16
Date	16-Feb-00	16-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00
VOC's								
EPA Method 8260	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,1,1-Trichloroethane	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
1,1,2,2-Tetrachloroethane	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
1,1,2-Trichloroethane	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
1,1-Dichloroethane	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
1,1-Dichloroethene	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
1,2-Dichloroethane	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
1,2-Dichloropropane	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
2-Butanone (MEK)	< 12.0	< 12.0	< 12.0	< 12.0	< 22.0	< 12.0	< 13.0	< 48
2-Hexanone	< 12.0	< 12.0	< 12.0	< 12.0	< 22.0	< 12.0	< 13.0	< 48
4-Methyl-2-pentanone (MIBK)	< 12.0	< 12.0	< 12.0	< 12.0	< 22.0	< 12.0	< 13.0	< 48
Acetone	B **41**	**29**	< 24.0	< 29.0	140	< 30.0	< 32.0	B T **230**
Benzene	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Bromodichloromethane	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Bromoform	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Bromomethane (Methyl bromide)	< 2.5	< 2.3	< 2.4	< 4.6	< 8.8	< 4.8	< 5.2	< 19
Carbon disulfide	B **4.2**	< 2.3	< 2.4	< 2.3	B **8.5**	< 2.4	< 2.6	< 10
Carbon tetrachloride	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Chlorobenzene	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Chloroethane	< 2.5	< 2.3	< 2.4	< 4.6	< 8.8	< 4.8	< 5.2	< 19
Chloroform	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Chloromethane	< 2.5	< 2.3	< 2.4	< 4.6	< 8.8	< 4.8	< 5.2	< 19
Cis/Trans-1,2-Dichloroethene	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
cis-1,3-Dichloropropene	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Dibromochloromethane	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Ethylbenzene	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Methylene chloride (Dichlorometha	< 6.2	< 5.8	< 6.1	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Styrene	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Tetrachloroethene	< 2.5	< 2.3	B **34**	< 2.3	< 4.4	< 2.4	B **8.4**	**13**
Toluene	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	**13**
trans-1,3-Dichloropropene	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Trichloroethene	< 2.5	< 2.3	< 2.4	< 2.3	< 4.4	< 2.4	< 2.6	< 10
Vinyl chloride	< 2.5	< 2.3	< 2.4	< 4.6	< 8.8	< 4.8	< 5.2	< 19
Xylenes, Total	< 5.0	< 4.7	< 4.8	< 4.6	< 8.8	< 4.8	< 5.2	< 19

Notes:

ug/kg = micrograms per kilogram; mg/l = milligrams per liter; mg/kg = milligrams per kilogram.

Bold type indicate analytical results above laboratory reporting limits. The superscript indicates the screening levels that were exceeded:

B= Background sample readings; R = EPA Region 3 Human health RBCs for industrial use scenario;

T=NYSDEC TAGM Recommended soil cleanup levels

TABLE 5
SEDIMENT ANALYTICAL DATA SUMMARY – SVOCs, PESTICIDES AND PCBs
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

TABLE 5
SEDIMENT ANALYTICAL DATA SUMMARY-SVOCs, PESTICIDES AND PCBs
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID	GC-SED-01	GC-SED-02	GC-SED-03	GC-SED-04	GC-SED-05	GC-SED-06	GC-SED-07	GC-SED-08
Date	16-Feb-00	16-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	16-Feb-00	16-Feb-00
SVOC's								
EPA Method 8270	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg		
2,2'-Oxybis(1-Chloropropane)	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
2,4,5-Trichlorophenol	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
2,4,6-Trichlorophenol	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
2,4-Dichlorophenol	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
2,4-Dimethylphenol	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
2,4-Dinitrophenol	< 2,000	< 2,000	< 3,600	< 2,200	< 2,000	< 2,200	< 2,300	< 2,200
2-Chlorophenol	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
2-Methylnaphthalene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
2-Methylphenol (o-cresol)	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
2-Nitroaniline	< 2,000	< 2,000	< 3,600	< 2,200	< 2,000	< 2,200	< 2,300	< 2,200
2-Nitrophenol	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
3-Methylphenol/4-Methylphenol	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
3-Nitroaniline	< 2,000	< 2,000	< 3,600	< 2,200	< 2,000	< 2,200	< 2,300	< 2,200
4,6-Dinitro-2-methylphenol	< 2,000	< 2,000	< 3,600	< 2,200	< 2,000	< 2,200	< 2,300	< 2,200
4-Chloro-3-methylphenol	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
4-Chloroaniline	< 780	< 760	< 1,400	< 850	< 770	< 850	< 900	< 860
4-Nitroaniline	< 2,000	< 2,000	< 3,600	< 2,200	< 2,000	< 2,200	< 2,300	< 2,200
4-Nitrophenol	< 2,000	< 2,000	< 3,600	< 2,200	< 2,000	< 2,200	< 2,300	< 2,200
Acenaphthene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Acenaphthylene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Anthracene	< 390	**780**	< 700	< 420	< 380	< 420	< 450	< 430
Benzo(a)anthracene	R T **720**	**1800**	**2000**	< 420	T **650**	< 420	< 450	< 430
Benzo(a)pyrene	T **720**	**1400**	**2000**	< 420	**590**	< 420	T **590**	< 430
Benzo(b)fluoranthene	**800**	**910**	**2000**	< 420	**530**	< 420	**580**	< 430
Benzo(g,h,i)perylene	**440**	**580**	**1400**	< 420	< 380	< 420	< 450	< 430
bis(2-Chloroethoxy)methane	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Diethylphthalate	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Pentachlorophenol	< 2,000	< 2,000	< 3,600	< 2,200	< 2,000	< 2,200	< 2,300	< 2,200
Phenol	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430

Notes:

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TA[illegible]5
SEDIMENT ANALYTICAL DATA SUM[illegible]Y-SVOCs, PESTICIDES AND PCBs
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID Date	GC-SED-09 16-Feb-00	GC-SED-10 17-Feb-00	GC-SED-11 17-Feb-00	GC-SED-12 17-Feb-00	GC-SED-13 17-Feb-00	GC-SED-15 17-Feb-00	GC-SED-16 17-Feb-00
SVOC's							
EPA Method 8270	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
2,2'-Oxybis(1-Chloropropane)	< 370	< 390	< 430	< 620	< 400	< 380	< 530
2,4,5-Trichlorophenol	< 370	< 390	< 430	< 620	< 400	< 380	< 530
2,4,6-Trichlorophenol	< 370	< 390	< 430	< 620	< 400	< 380	< 530
2,4-Dichlorophenol	< 370	< 390	< 430	< 620	< 400	< 380	< 530
2,4-Dimethylphenol	< 370	< 390	< 430	< 620	< 400	< 380	< 530
2,4-Dinitrophenol	< 1,900	< 2,000	< 2,200	< 3,200	< 2,100	< 1,900	< 2,700
2-Chlorophenol	< 370	< 390	< 430	< 620	< 400	< 380	< 530
2-Methylnaphthalene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
2-Methylphenol (o-cresol)	< 370	< 390	< 430	< 620	< 400	< 380	< 530
2-Nitroaniline	< 1,900	<2000	< 2,200	< 3,200	< 2,100	< 1,900	< 2,700
2-Nitrophenol	< 370	< 390	< 430	< 620	< 400	< 380	**530**
3-Methylphenol/4-Methylphenol	< 370	< 390	< 430	< 620	< 400	< 380	< 530
3-Nitroaniline	< 1,900	< 2,000	< 2,200	< 3,200	< 2,100	< 1,900	< 2,700
4,6-Dinitro-2-methylphenol	< 1,900	< 2,000	< 2,200	< 3,200	< 2,100	< 1,900	< 530
4-Chloro-3-methylphenol	< 370	< 390	< 430	< 620	< 400	< 380	< 530
4-Chloroaniline	< 740	< 780	< 860	< 1,200	< 800	< 750	< 1,100
4-Nitroaniline	< 1,900	< 2,000	< 2,200	< 3,200	< 2,100	< 1,900	< 2,700
4-Nitrophenol	< 1,900	< 2,000	< 2,200	< 3,200	< 2,100	< 1,900	< 530
Acenaphthene	< 370	< 390	< 430	< 620	< 400	< 380	< 2,700
Acenaphthylene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Anthracene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Benzo(a)anthracene	< 370	< 390	RT **870**	< 620	RT **710**	**950**	< 530
Benzo(a)pyrene	< 370	< 390	**1200**	< 620	**740**	**1400**	< 530
Benzo(b)fluoranthene	**390**	< 390	**950**	< 620	**800**	**1000**	T **1300**
Benzo(g,h,i)perylene	< 370	< 390	**2000**	< 620	**540**	**950**	**1000**
bis(2-Chloroethoxy)methane	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Diethylphthalate	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Pentachlorophenol	< 1,900	< 2,000	< 2,200	< 3,200	< 2,100	< 1,900	< 530
Phenol	< 370	< 390	< 430	< 620	< 400	< 380	< 530

Notes:

ug/kg = micrograms per kilogram; mg/l = milligrams per liter; mg/kg = milligrams per kilogram.

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TABLE 5
SEDIMENT ANALYTICAL DATA SUMMARY-SVOCs, PESTICIDES AND PCBs
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID Date	GC-SED-01 16-Feb-00	GC-SED-02 16-Feb-00	GC-SED-03 17-Feb-00	GC-SED-04 17-Feb-00	GC-SED-05 17-Feb-00	GC-SED-06 17-Feb-00	GC-SED-07 16-Feb-00	GC-SED-08 16-Feb-00
1,2,4-Trichlorobenzene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
1,2-Dichlorobenzene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
1,3-Dichlorobenzene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
1,4-Dichlorobenzene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
2,4-Dinitrotoluene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
2,6-Dinitrotoluene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
2-Chloronaphthalene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
3,3'-Dichlorobenzidine	< 780	< 760	< 1,400	< 850	< 770	< 850	< 900	< 860
4-Bromophenylphenyl ether	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
4-Chlorophenylphenyl ether	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Benzo(k)fluoranthene	**610**	**1100** [T]	**2200** [T]	< 420	**510**	< 420	**490**	< 430
bis(2-Chloroethyl)ether	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
bis(2-Ethylhexyl)phthalate	< 390	< 380	2700	< 420	< 380	**1500**	**1100**	< 430
Butylbenzylphthalate	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Carbazole	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Chrysene	**840** [T]	**1600** [T]	**2500** [T]	< 420	**730** [T]	< 420	**490** [T]	< 430
Dibenzo(a,h)anthracene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Dibenzofuran	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Dimethylphthalate	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Di-n-butylphthalate	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Di-n-octylphthalate	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Fluoranthene	**1700**	**1800**	5500	< 420	**1600**	**770**	**650**	**460**
Fluorene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Hexachlorobenzene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Hexachlorobutadiene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Hexachlorocyclopentadiene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Hexachloroethane	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Indeno(1,2,3-cd)pyrene	**420**	**550**	1200	< 420	< 380	< 420	< 450	< 430
Isophorone	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Naphthalene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Nitrobenzene	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
N-Nitroso-di-n-propylamine	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
N-Nitrosodiphenylamine/Diphenylamine	< 390	< 380	< 700	< 420	< 380	< 420	< 450	< 430
Phenanthrene	**1300**	**410**	**1700**	< 420	**1000**	< 420	< 450	< 430
Pyrene	**1800**	**3100**	**4100**	< 420	**1200**	**730**	**1200**	**520**

Notes:

ug/kg = micrograms per kilogram; mg/l = milligrams per liter; mg/kg = milligrams per kilogram.

Bold type indicate analytical results above laboratory reporting limits. The superscript indicates the screening levels that were exceeded:

B= Background sample readings; R = EPA Region 3 Human health RBCs for industrial use scenario;

T=NYSDEC TAGM Recommended soil cleanup levels

TA[illegible]5

SEDIMENT ANALYTICAL DATA SUM[illegible]Y-SVOCs, PESTICIDES AND PCBs

GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

Glen Cove, New York

Sample ID	GC-SED-09	GC-SED-10	GC-SED-11	GC-SED-12	GC-SED-13	GC-SED-15	GC-SED-16
Date	16-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00
1,2,4-Trichlorobenzene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
1,2-Dichlorobenzene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
1,3-Dichlorobenzene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
1,4-Dichlorobenzene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
2,4-Dinitrotoluene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
2,6-Dinitrotoluene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
2-Chloronaphthalene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
3,3'-Dichlorobenzidine	< 740	< 780	< 860	< 1,200	< 800	< 750	< 1,100
4-Bromophenylphenyl ether	< 370	< 390	< 430	< 620	< 400	< 380	< 530
4-Chlorophenylphenyl ether	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Benzo(k)fluoranthene	< 370	< 390	**1000**	< 620	**720**	[T] **1100**	1700
bis(2-Chloroethyl)ether	< 370	< 390	< 430	< 620	< 400	< 380	< 530
bis(2-Ethylhexyl)phthalate	< 370	< 390	< 430	< 620	**640**	< 380	< 530
Butylbenzylphthalate	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Carbazole	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Chrysene	[T] **410**	< 390	[T] **1100**	< 620	960	[T] **1000**	< 530
Dibenzo(a,h)anthracene	< 370	< 390	[B T] **2200**	< 620	< 400	**790**	< 530
Dibenzofuran	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Dimethylphthalate	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Di-n-butylphthalate	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Di-n-octylphthalate	< 370	< 390	< 430	< 620	< 400	**540**	< 530
Fluoranthene	**540**	**590**	**2000**	**660**	**2000**	**1900**	**3500**
Fluorene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Hexachlorobenzene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Hexachlorobutadiene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Hexachlorocyclopentadiene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Hexachloroethane	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Indeno(1,2,3-cd)pyrene	< 370	< 390	2900	< 620	**570**	[R] **1200**	< 530
Isophorone	< 370	< 390	< 430	< 620	< 40	< 380	< 530
Naphthalene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Nitrobenzene	< 370	< 390	< 430	< 620	< 400	< 380	< 530
N-Nitroso-di-n-propylamine	< 370	< 390	< 430	< 620	< 400	< 380	< 530
N-Nitrosodiphenylamine/Diphenylamine	< 370	< 390	< 430	< 620	< 400	< 380	< 530
Phenanthrene	< 370	< 390	1100	< 620	1200	890	< 530
Pyrene	**660**	**500**	**1700**	**670**	**1500**	**1900**	< 530

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T=NYSDEC TAGM Recommended soil cleanup levels

TA[illegible]5

SEDIMENT ANALYTICAL DATA SUM[illegible]RY-SVOCs, PESTICIDES AND PCBs

GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

Glen Cove, New York

Sample ID Date	GC-SED-01 16-Feb-00	GC-SED-02 16-Feb-00	GC-SED-03 17-Feb-00	GC-SED-04 17-Feb-00	GC-SED-05 17-Feb-00	GC-SED-06 17-Feb-00	GC-SED-07 16-Feb-00	GC-SED-08 16-Feb-00
Pesticides/PCB **EPA Method 8081**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg		
4,4'-DDD	**4.2**	**5.3**	**9.6**	< 4.2	< 6.6	**12**	[B] **130**	**7.3**
4,4'-DDE	< 3.9	**3.9**	**4.4**	< 4.2	< 6.6	< 6.2	**32**	< 4.3
4,4'-DDT	< 3.9	< 3.8	< 3.3	< 4.2	< 6.9	< 4.2	< 12	< 4.3
Aldrin	< 2.0	< 1.9	**1.9**	< 2.2	< 3.4	< 2.2	< 12	< 2.2
alpha-BHC	< 2.0	< 1.9	< 1.7	< 2.2	< 3.4	< 2.2	< 12	< 2.2
beta-BHC	**2.8**	< 1.9	< 1.7	< 2.2	< 3.4	< 2.2	< 12	< 2.2
Chlordane (technical)	< 20.0	< 19.0	< 17.0	< 22.0	< 34.0	< 22.0	< 120	< 22.0
delta-BHC	< 2.0	< 1.9	< 1.7	< 2.2	< 3.4	< 2.2	< 12	< 2.2
Dieldrin	< 3.9	< 3.8	< 3.3	< 4.2	[B] **38**	< 2.2	< 12	< 4.3
Endosulfan I	< 2.0	< 1.9	**5.2**	< 2.2	**3.4**	< 2.2	< 12	< 2.2
Endosulfan II	< 3.9	< 3.8	< 3.3	< 4.2	< 6.6	< 4.2	< 23	< 4.3
Endosulfan sulfate	< 3.9	< 3.8	< 3.3	< 4.2	< 6.6	< 4.2	< 23	< 4.3
Endrin	< 3.9	< 3.8	< 3.3	< 4.2	< 6.6	< 4.2	< 23	< 4.3
Endrin aldehyde	< 3.9	< 3.8	< 3.3	< 4.2	< 6.6	< 4.2	< 23	< 4.3
gamma-BHC (Lindane)	< 2.0	< 1.9	< 1.7	< 2.2	< 3.4	< 2.2	< 12	< 2.2
Heptachlor	< 2.0	< 1.9	< 1.7	< 2.2	**3.4**	< 2.2	< 12	< 2.2
Heptachlor epoxide	< 2.0	**4.9**	< 1.7	< 2.2	< 3.4	< 2.2	< 12	< 2.2
Methoxychlor	< 20.0	< 19.0	< 17.0	< 22.0	< 34.0	< 22.0	< 120	< 22.0
Toxaphene	< 200.0	< 190.0	< 170.0	< 220.0	< 340.0	< 220.0	< 1,200	< 220.0
PCB **EPA Method 8082**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg		
Aroclor-1242	< 39	< 38	< 33	< 42	< 66	< 42	< 230	< 43
Aroclor-1254	< 39	**72**	< 33	< 42	< 66	< 42	< 230	< 43
Aroclor-1221	< 79	< 77	< 66	< 86	< 130	< 86	< 460	< 88
Aroclor-1232	< 39	< 38	< 33	< 42	< 66	< 42	< 230	< 43
Aroclor-1248	< 39	< 38	< 33	< 42	< 66	< 42	< 230	< 43
Aroclor-1260	< 39	< 38	< 33	< 42	< 66	< 42	< 230	< 43
Aroclor-1016	< 39	< 38	< 33	< 42	< 66	< 42	< 230	< 43

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SEDIMENT ANALYTICAL DATA SUM[illegible]Y-SVOCs, PESTICIDES AND PCBs

GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

Glen Cove, New York

Sample ID	GC-SED-09	GC-SED-10	GC-SED-11	GC-SED-12	GC-SED-13	GC-SED-15	GC-SED-16
Date	16-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00
Pesticides/PCB							
EPA Method 8081	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4,4'-DDD	**6.3**	**5.9**	**13**	< 12.0	< 4.0	< 3.8	< 27
4,4'-DDE	**4**	< 3.2	**5.5**	< 12.0	11	< 3.8	< 27
4,4'-DDT	**4.3**	**5.2**	**9.6**	< 12.0	**16**	< 3.8	B **34**
Aldrin	< 1.9	< 1.7	< 2.2	< 6.4	< 2.1	< 1.9	< 14
alpha-BHC	< 1.9	< 1.7	< 2.2	< 6.4	< 2.1	< 1.9	< 14
beta-BHC	< 1.9	< 1.7	< 2.2	< 6.4	< 2.1	< 1.9	< 14
Chlordane (technical)	< 19.0	< 17.0	< 22.0	< 6.4	< 21.0	< 19.0	< 140
delta-BHC	< 1.9	< 1.7	< 2.2	< 6.4	< 2.1	< 1.9	< 14
Dieldrin	< 3.7	**5.1**	< 4.3	< 14.0	< 4.0	< 3.8	< 27
Endosulfan I	< 1.9	2.7	< 2.2	< 6.4	< 2.1	< 1.9	< 14
Endosulfan II	< 3.7	< 3.2	< 4.3	< 12.0	< 4.0	< 3.8	< 27
Endosulfan sulfate	< 3.7	< 3.2	< 4.3	< 12.0	< 4.0	< 3.8	< 27
Endrin	< 3.7	< 3.2	< 4.3	< 12.0	< 4.0	< 3.8	< 27
Endrin aldehyde	< 3.7	< 3.2	< 4.3	< 12.0	< 4.0	< 3.8	< 21
gamma-BHC (Lindane)	< 1.9	< 1.7	< 2.2	< 6.4	< 2.1	< 1.9	< 14
Heptachlor	< 1.9	**8.1**	< 2.2	< 6.4	< 2.1	< 1.9	< 14
Heptachlor epoxide	< 1.9	< 1.7	< 2.2	< 6.4	< 2.1	< 1.9	< 14
Methoxychlor	< 19.0	< 17.0	< 22.0	< 64.0	< 21.0	< 19.0	< 140
Toxaphene	< 190.0	< 170.0	< 220.0	< 640.0	< 210.0	< 190.0	< 1,400
PCB							
EPA Method 8082	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Aroclor-1016	< 37	< 32	< 43	< 120	< 40	< 38	< 270
Aroclor-1221	< 75	< 66	< 87	< 250	< 82	< 76	< 540
Aroclor-1232	< 37	< 32	< 43	< 120	< 40	< 38	< 270
Aroclor-1242	< 37	< 32	< 43	< 120	< 40	< 38	< 270
Aroclor-1248	< 37	< 32	< 43	< 120	< 40	< 38	< 270
Aroclor-1254	< 37	< 32	< 43	< 120	< 40	< 38	< 270
Aroclor-1260	< 37	< 32	< 43	< 120	< 40	< 38	< 270

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TABLE 6
SEDIMENT ANALYTICAL DATA SUMMARY – TAL METALS, TCLP METALS
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

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GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID	GC-SED-01	GC-SED-02	GC-SED-03	GC-SED-04	GC-SED-05	GC-SED-06	GC-SED-07	GC-SED-08
Date	16-Feb-00	16-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	17-Feb-00	16-Feb-00	16-Feb-00
TAL Metals								
EPA Method 6010	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	**1000**	**1100**	**6200**	**4500**	**1600**	**8400**	**5000**	**4300**
Antimony	< 2.2	< 2.1	< 3.50	< 2.3	< 2.3	< 2.3	< 2.7	< 5.3
Arsenic	R 1.5	< 1.1	RT 9.9	R 4.6	1.4	RT 7.5	19	14
Barium	**14**	**5.3**	**28**	**49**	**12**	**41**	**100**	**24**
Beryllium	< 0.43	< 0.4	<0.71	<0.47	<0.47	T 0.5	<0.55	T 0.7
Cadmium	< 0.54	< 0.53	T 2.2	<0.58	<0.58	**0.98**	**4.1**	<1.3
Calcium	**4400**	**1900**	**9400**	**22000**	**3400**	**2300**	**4200**	**1000**
Chromium	**5.7**	**4.1**	T 34	**6.5**	**4.7**	T 23	**31**	**100**
Cobalt	< 1.1	< 1.1	**8.1**	**4.2**	**1.3**	**7.8**	**6.5**	**5.9**
Copper	**10**	**12**	T 140	**13**	**13**	T **51**	**150**	**28**
Iron	**3800**	**3700**	RT 23000	**8000**	**5800**	T **17000**	RT **26000**	**140000**
Lead	**21**	16	**250**	**11**	**19**	**72**	**290**	**20**
Magnesium	**2500**	**1300**	**6800**	**10000**	**2300**	**3700**	**3900**	**1600**
Manganese	**30**	**27**	**220**	R 1900	**71**	**220**	**160**	R 1700
Nickel	< 4.3	< 4.2	T 26	**7.4**	<4.7	T 14	**17**	**18**
Potassium	**150**	**210**	**880**	**510**	**150**	**1600**	**790**	**1100**
Selenium	< 1.1	< 1.1	< 1.80	< 1.2	< 1.2	< 1.2	T 2.4	< 1.3
Silver	< 1.1	< 1.1	**20**	**2.4**	<1.2	**13**	**48**	< 1.3
Sodium	**360**	**180**	**2000**	**2600**	**130**	**2100**	**1700**	**1900**
Thallium	< 1.1	< 1.1	< 1.80	< 1.2	< 1.2	< 1.2	< 6.8	< 13.0
Vanadium	**6.4**	**5.9**	**33**	**8.6**	**8**	**26**	**28**	**22**
Zinc	**33**	**22**	T 310	**110**	**29**	T **88**	**160**	**51**
Mercury								
EPA Method 7471	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Mercury	< 0.022	0.031	0.25	<0.023	<0.021	**0.11**	T 0.52	**0.038**

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TABLE 6
SEDIMENT ANALYTICAL DATA SUMMARY - TAL METALS, TCLP METALS
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID	**GC-SED-01**	**GC-SED-02**	**GC-SED-03**	**GC-SED-04**	**GC-SED-05**	**GC-SED-06**	**GC-SED-07**	**GC-SED-08**
Date	**16-Feb-00**	**16-Feb-00**	**17-Feb-00**	**17-Feb-00**	**17-Feb-00**	**17-Feb-00**	**16-Feb-00**	**16-Feb-00**
TCLP METALs								
EPA Method 6010	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Arsenic (TCLP)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Barium (TCLP)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium (TCLP)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.11	< 0.1
Chromium (TCLP)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Lead (TCLP)	[B] **0.23**	**0.4**	**0.39**	< 0.2	< 0.2	[B] **0.5**	**1.3**	< 0.2
Selenium (TCLP)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Silver (TCLP)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Mercury in TCLP								
EPA Method 7470	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Mercury (TCLP)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

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TABLE 6
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GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

	GC-SED-09 16-Feb-00	GC-SED-10 17-Feb-00	GC-SED-11 17-Feb-00	GC-SED-12 17-Feb-00	GC-SED-13 17-Feb-00	GC-SED-15 17-Feb-00	GC-SED-16 17-Feb-00
TAL Metals **EPA Method 6010**	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	**2300**	**1300**	**2200**	**11000**	**1400**	**1200**	**5700**
Antimony	< 2.0	< 2.4	< 2.4	**3.4**	< 2.2	< 2.3	< 2.9
Arsenic	< 1.0	<1.2	R **1200**	T **15**	R **1200**	**1200**	**1200**
Barium	**7.6**	**9.5**	**16**	**85**	**9.2**	**9.4**	**70**
Beryllium	< 0.41	<0.48	<0.47	T **0.83**	< 0.4	<0.45	< 0.6
Cadmium	< 0.51	<0.6	<0.59	**1.9**	< 0.55	< 0.57	T **1.3**
Calcium	**2500**	**1400**	**2800**	**8500**	**9300**	**1000**	**9100**
Chromium	**3.9**	**4**	T **11**	**26**	**3.8**	**6.9**	T **38**
Cobalt	**1.1**	<1.2	**3.1**	**19**	**1.9**	< 1.1	**5.4**
Copper	T **25**	**13**	**23**	T **110**	**14**	**9.3**	T **74**
Iron	**5600**	**4400**	**6500**	**20000**	**6900**	**5600**	**14000**
Lead	**22**	**21**	**36**	**320**	**26**	**13**	**240**
Magnesium	**1200**	**1000**	**2200**	**5300**	**5100**	**800**	**5000**
Manganese	**42**	**43**	**62**	**260**	**84**	**40**	**350**
Nickel	< 4.1	<4.8	8.6	T **32**	< 4.4	<4.5	T **18**
Potassium	**210**	**190**	**390**	**1100**	**190**	**150**	**390**
Selenium	< 1.0	< 1.2	< 1.2	T **2**	< 1.1	< 1.1	< 1.5
Silver	< 1.0	<1.2	<1.2	**4.2**	< 1.1	<1.1	< 1.5
Sodium	**770**	**87**	**110**	**580**	**150**	**82**	**160**
Thallium	< 1.0	< 1.2	< 1.2	<1.7	< 1.1	< 1.1	< 1.5
Vanadium	**3.9**	**5.1**	**7.6**	**52**	**20**	**8.1**	**26**
Zinc	**34**	**25**	52	T **450**	52	**23**	T **220**
Mercury **EPA Method 7471**	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Mercury	<0.020	<0.022	**0.071**	**0.28**	<0.022	<0.021	**0.24**

Notes:

ug/kg = micrograms per kilogram; mg/l = milligrams per liter; mg/kg = milligrams per kilogram.

Bold type indicate analytical results above laboratory reporting limits. The superscript indicates the screening levels that were exceeded:

B= Background sample readings; R = EPA Region 3 Human health RBCs for industrial use scenario;

T=NYSDEC TAGM Recommended soil cleanup levels

TABLE 6
SEDIMENT ANALYTICAL DATA SUMMARY - TAL METALS, TCLP METALS
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

	GC-SED-09 16-Feb-00	GC-SED-10 17-Feb-00	GC-SED-11 17-Feb-00	GC-SED-12 17-Feb-00	GC-SED-13 17-Feb-00	GC-SED-15 17-Feb-00	GC-SED-16 17-Feb-00
TCLP METALs							
EPA Method 6010	mg/l	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Arsenic (TCLP)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Barium (TCLP)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium (TCLP)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chromium (TCLP)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Lead (TCLP)	B **0.27**	**0.2**	**0.31**	**0.53**	**0.3**	< 0.2	< 0.2
Selenium (TCLP)	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Silver (TCLP)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Mercury in TCLP							
EPA Method 7470	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Mercury (TCLP)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

Notes:

ug/kg = micrograms per kilogram; mg/l = milligrams per liter; mg/kg = milligrams per kilogram.

Bold type indicate analytical results above laboratory reporting limits. The superscript indicates the screening levels that were exceeded:

B= Background sample readings; R = EPA Region 3 Human health RBCs for industrial use scenario;

T=NYSDEC TAGM Recommended soil cleanup levels

TABLE 7
SEDIMENT ANALYTICAL DATA SUMMARY – NITRITE/NITRATE, FECAL COLOFORM
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

TABLE 7
SEDIMENT ANALYTICAL DATA SUMMARY - NITRITE/NITRATE, FECAL COLIFORM
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID Date	Reporting Limits	GC-SED-01 16-Feb-00	GC-SED-02 16-Feb-00	GC-SED-03 17-Feb-00	GC-SED-04 17-Feb-00	GC-SED-05 17-Feb-00	GC-SED-06 17-Feb-00	GC-SED-07 16-Feb-00	GC-SED-08 16-Feb-00
Nitrite **EPA/CE-81-1(3-183)**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Nitrite-N		<6.0	<5.8	<11	<11	< 5.8	**13.0**	<6.8	<6.6
Nitrate **EPA/CE-81-1(3-193)**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Nitrate-N		<6.0	<5.8	<11	<11	< 5.8	<6.4	<6.8	<6.6
FECAL COLIFORM MT	mpn/g dw	mpn/g dw	mpn/g dw	mpn/g dw	mpn/g dw	mpn/g dw	mpn/g dw	mpn/g dw	mpn/g dw
Fecal Coliform MT		**27**	**27**	<3	N **380**	**2800**	<3	**5**	**11**

Notes:

ug/kg = micrograms per kilogram; mg/l = milligrams per liter; mg/kg = milligrams per kilogram.

Bold type indicate analytical results above laboratory reporting limits. The superscript indicates the screening levels that were exceeded:

N = NYSDEC Class I Surface Saline Waters for Fecal Coliform

TA[illegible]7
SEDIMENT ANALYTICAL DATA SUMMA[illegible] NITRITE/NITRATE, FECAL COLIFORM
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

	GC-SED-09 16-Feb-00	GC-SED-10 17-Feb-00	GC-SED-11 17-Feb-00	GC-SED-12 17-Feb-00	GC-SED-13 17-Feb-00	GC-SED-15 17-Feb-00	GC-SED-16 17-Feb-00
Nitrite **EPA/CE-81-1(3-183)**	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Nitrite-N	<5.6	<6.0	<6.0	<9.4	<6.1	<5.8	<8.1
Nitrate **EPA/CE-81-1(3-193)**	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Nitrate-N	<5.6	<6.0	<6.0	<9.4	<6.1	<5.8	<8.1
FECAL COLIFORM MT	mpn/g dw	mpn/g dw	mpn/g dw	mpn/g dw	mpn/g dw	mpn/g dw	mpn/g dw
Fecal Coliform MT	N **560**	**600**	**1700**	**4500**	**1600**	**2700**	**110**

Notes:

ug/kg = micrograms per kilogram; mg/l = milligrams per liter; mg/kg = milligrams per kilogram.

Bold type indicate analytical results above laboratory reporting limits. The superscript indicates the screening levels that were exceeded:

N = NYSDEC Class I Surface Saline Waters for Fecal Coliform

TABLE 8
SIEVE ANALYSIS DATA SUMMARY
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT

TABLE 8
SIEVE ANALYSIS DATA SUMMARY
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID	**GC-SED-01**	**GC-SED-02**	**GC-SED-03**	**GC-SED-04**	**GC-SED-05**	**GC-SED-06**	**GC-SED-07**	**GC-SED-08**
Date	**16-Feb-00**	**16-Feb-00**	**17-Feb-00**	**17-Feb-00**	**17-Feb-00**	**17-Feb-00**	**16-Feb-00**	**16-Feb-00**
Sieve Analysis								
%Clay	1.90	0.00	6.30	3.20	0.00	22.50	4.90	7.60
%Cobbles	--	--	--	--	--	--	--	--
%Gravel	0.30	4.20	13.70	17.70	5.10	3.00	15.50	3.60
%Sand	96.70	94.90	63.40	77.80	93.30	31.60	57.40	69.00
%Silt	1.10	0.90	16.60	1.30	1.60	42.90	22.20	19.80

TABLE 8
SIEVE ANALYSIS DATA SUMMARY
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID Date	GC-SED-09 16-Feb-00	GC-SED-10 17-Feb-00	GC-SED-11 17-Feb-00	GC-SED-12 17-Feb-00	GC-SED-13 17-Feb-00	GC-SED-15 17-Feb-00	GC-SED-16 17-Feb-00
Sieve Analysis							
%Clay	0.30	0.00	0.00	9.90	0.00	0.00	1.90
%Cobbles	--	--	--	--	--	--	--
%Gravel	12.30	0.10	19.60	0.90	27.70	17.30	6.20
%Sand	84.80	98.60	76.80	42.80	68.00	81.40	69.60
%Silt	2.60	1.30	3.60	46.40	4.30	1.30	22.30

TABL[illegible]

SIEVE ANALYSIS DATA SUMMARY
GLEN COVE CREEK BROWNFIELDS SITE ASSESSMENT
Glen Cove, New York

Sample ID Date	GC-SS-01 15-Feb-00	GC-SS-02 15-Feb-00	GC-SS-03 15-Feb-00	GC-SS-04 16-Feb-00	GC-SS-05 16-Feb-00	GC-SS-06 16-Feb-00	GC-SS-07 15-Feb-00	GC-SS-08 16-Feb-00	GC-SS-09 16-Feb-00
Sieve Analysis									
%Clay	8.70	4.00	5.10	4.60	7.60	5.30	8.00	5.50	10.40
%Cobbles	--	--	--	--	--	--	--	--	--
%Gravel	6.80	13.30	7.30	19.90	10.30	15.00	6.90	15.40	10.20
%Sand	69.20	74.90	79.10	63.40	58.30	68.20	69.60	62.40	46.10
%Silt	15.30	7.80	8.50	12.10	23.80	11.50	15.50	16.70	33.30

ATTACHMENT I

POTENTIAL RESTORATION ALTERNATIVES

FOR GLEN COVE CREEK

DISCUSSION OF POTENTIAL RESTORATION ALTERNATIVES FOR GLEN COVE CREEK.

The following suggested alternatives are derived from a discussion of dredged material beneficial use alternatives in Yozzo et al. (1999).

A variety of habitat restoration options could be implemented in Glen Cove Creek, many of which could involve the beneficial use of dredged material. Subtidal estuarine habitats (e.g. the main channel of Glen Cove Creek) could be filled and recontoured to enhance existing benthic invertebrate communities. Dredged channels and pits are typically characterized by poor sediment and water quality, and serve as a retention area for refuse, fine grained organic matter, and contaminants. Because these areas are artificially deepened, light penetration is significantly reduced relative to natural estuarine habitats. Thus, benthic productivity (e.g. submerged aquatic vegetation, macroalgae) is reduced or in some cases entirely absent. Recountouring the bottom using dredged material (often with a clean sand cap) into the photic zone increases productivity, and encourages recolonization by benthic and epiphytic invertebrates as well as motile estuarine fauna, such as fishes and macrocrustaceans.

Creation of intertidal mudflats and /or tidal marshes may be accomplished in shallow areas such as the dogleg of Glen Cove Creek. Sediments in the dogleg area are contaminated, therefore existing substrate would need to be excavated and the area backfilled with either clean sand, or dredged material and a clean sand cap. Careful attention to elevation and natural geomorphology is necessary to ensure adequate and appropriate tidal flushing. This may be readily accomplished by measuring geomorphic features and elevation at a nearby "reference" site. If intertidal mudlfat is the desired habitat type, no further site preparation would be necessary. Created mudflats are rapidly colonized by estuarine invertebrates, including worms, clams and crustaceans (Ray et al. 1994). These habitats represent a valuable food resource for wading birds and estuarine fishes.

Salt marsh creation may be a preferred restoration alternative in Glen Cove Creek and the dogleg area. The restoration and creation of intertidal marshes has received much attention in coastal engineering. This is likely due to the considerable acreage of tidal marsh that has been lost along U.S. coastlines, recent recognition of the important functions provided by intertidal marshes, and the relative ease in which tidal marsh vegetation can be propagated upon dredged material. It is important to distinguish between "restoration" and "creation" of intertidal marshes, although the two terms are often used interchangeably. *Restoration* generally refers to projects in which an area is returned to a close approximation of some natural or known historical condition. In tidal marsh environments, this may involve removal of dikes, berms, and fill material, or installation of culverts under roadways to re-establish the natural tidal prism.

Marsh *creation* is often a component of the restoration process, especially in projects involving the removal of fill and/or regrading of adjacent uplands to intertidal elevations.

However, it is important to recognize that marshes can often be created for habitat development or improvement in upland or shallow subtidal areas which have not historically supported intertidal vegetation; these projects would not correctly be termed "restoration" in a site-specific context, though they could easily be viewed as restoring lost regional wetland acreage.

Planting of smooth cordgrass (*Spartina alterniflora*) (or other species, depending on elevation) is accomplished using using culms which are readily available from commercial nurseries. There exists a considerable literature of planting techniques for *Spartina* marshes in the eastern U.S.(Barko et al. 1977, Garbisch 1977, Lunz et al 1978). This is one of the most successful types of habitat restoration, and examples of *Spartina* marsh plantings date back to the 1920's.

The USACE's Dredged Material Research Program (DMRP) pioneered large-scale tidal marsh establishment on all three U.S. coastlines in the 1970's. Successive research has focused on refining techniques developed under the DMRP, and in recent years, increased attention has focused on replication of ecosystem functions in created or restored wetlands. Salt marsh ecosystem functions include shoreline stabilization, floodwater storage and desynchronization, provision of habitat for estuarine-dependent finfish and invertebrates, and provision of nesting/foraging habitat for birds and other wildlife. Salt marshes may provide natural filtration and decontamination of landfill leachate and urban stormwater inputs.

Salt marsh creation projects in the Glen Cove District should incorporate re-establishment of the historic tidal flow regime where feasible, and should include plans to control or manage invasive plant species (e.g. *Phragmites australis*). Creation of intertidal salt marsh in the dogleg area would require removal of contaminated sediments and replacement with clean sand, prior to grading and planting. This is necessary to prevent the release of contaminants into surface waters and to minimize sequestration of contaminants by emergent vegetation, infaunal/epifaunal invertebrates, and wading birds.

Planting of salt marsh vegetation may also be employed as a "shoreline softening" technique, as an alternative to traditional shoreline stabilization structures such as revetments, or bulkheads. This alternative provides a useful and aesthetically pleasing buffer of marsh vegetation along industrial or densely populated waterfront areas; however, it is not likely to consume significant quantities of dredged material for implementation.

Creation of discrete cells or fringes of salt marsh within an urban matrix is a feasible option for the Glen Cove Creek District. For example, in the City of Charleston, South Carolina, salt marsh habitat is maintained in several areas of the city's waterfront, and public recreation access is provided via boardwalks and observation platforms (D. Yozzo, pers. obs). Recent tidal marsh restoration efforts in the Hackensack Meadowlands region of New Jersey are achieving significant improvements in ecosystem structure and function within a densely populated urban and industrial setting (Doss, 2000).

A combination of intertidal, shallow subtidal, and deeper subtidal habitats may be created along an elevation/bathymetric continuum in areas of Glen Cove Creek. This technique, known as "In-Bay Terracing" has been employed successfully on the Pacific coast of the U.S. (Rhoads and Lunz 1996). This restoration approach involves creating several "terraces" using dredged material from the intertidal zone into deeper water. Both clean and contaminated sediments have been used in construction of in-bay terraces. Typically, contaminated sediments are placed at the base levels behind containment dikes. Successive, shallower levels are constructed using clean sand or silt. Use of rock substrate to stabilize the terrace perimeter provides an added benefit of complex structure for use as a refuge/foraging habitat by fishes and crustaceans. Each terrace provides habitat for different species groups, and provides spatial heterogeneity, an important component in successful, holistic restoration designs (Pastorok et al 1997).

Finally, existing shoreline protection/stabilization structures such as bulkheads and sheet-pile structures could be removed and replaced with environmentally-beneficial shoreline stabilization structures such as riprap revetments and breakwaters. These structures, either fully or partially submerged, provide a spatially complex habitat which is used as a nursery and refuge by juvenile fishes and crustaceans. These structures can be used alone or in conjunction with any of the habitat creation/restoration scenarios described above.

Habitat restoration options which require the removal of contaminated sediments would require coordination among the appropriate regulatory agencies (USACE, USEPA, NYSDEC) for testing and identification of dredged material treatment/disposal options. Any proposed habitat development or restoration project will likely require an archaeological survey to address prehistoric and historic cultural resources, particularly in areas of historic navigational significance.

Habitat restoration projects in the Glen Cove Creek and dogleg area will require evaluation of the habitat trade-offs (e.g. intertidal salt marsh creation vs. existing subtidal habitat). Intertidal wetland or mudflat creation in the dogleg of Glen Cove Creek would require consideration of the effects of high-flow sedimentation events in the overall design of the project; ideally, the design should provide for long-term monitoring and maintenance of the restored habitat (eg. sediment removal, topographic recontouring, revegetation) throughout the project's life-span.

It is recommended that a topographic survey, a historical analysis of land use, and a comprehensive survey of discharges located within the Cedar Creek Watershed be performed to quantify all sources of sediment reaching Glen Cove Creek. Implementation of a Soil Erosion and Sediment Control Program within the Cedar Creek Watershed could significantly reduce the sediment load entering the Mill Pond and Glen Cove Creek. An inventory of recent and proposed construction projects and identification of any new sources of sediment will assist in forecasting the amount of additional sediment load entering into the waterway.

Regulatory authority for habitat restoration/development projects is provided under Section 404 (b)(1) of the Clean Water Act of 1972, Section 1135 of WRDA of 1986 and Section 206 of WRDA 1996. In addition, Section 204 of WRDA of 1992 provides funding and authority for the beneficial use of dredged material for creation and restoration of aquatic or related habitats in association with construction, operation or maintenance of authorized navigation projects. Section 216 of the Rivers and Harbors Act of 1970 authorizes the USACE to review navigation projects and recommend modifications that would involve habitat creation/restoration using dredged material. Habitat development projects in navigable waters are also subject to regulation under New York State laws, statutes, and permitting authorities.

In order to conduct ecosystem restoration project within the Glen Cove District under Section 206 of WRDA 1996 or Section 204 of WRDA 1992, the local sponsor (e.g. State of NY, City of Glen Cove) must demonstrate legal and financial authority to provide the funding and real estate for a project, and request assistance from the USACE's Civil Works Program. The details of the Planning, Pre-Construction, Engineering and Design, Construction, and Operation phases of a USACE Civil Works/Ecosystem Restoration Project are outlined in the USACE's Project Partnership Kit (Blakey et al. 1996)

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